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ABSTRACT

The purpose of this review was to examine research designs in studying knowledge utilization. The results are based on 32 studies of knowledge utilization, and the report describes the various types of research designs and their strengths and weaknesses. Survey research methods are appropriate for dealing with either of two aspects of a qualitative research topic: issues of frequency, and issues of perception and attitude. Beyond these issues, survey strategies have limited applications in qualitative research. The case study was the most common research strategy used in these 32 studies. Although multiple-case studies are able to deal with the entire knowledge utilization process in an explanatory manner, they are not good tools for establishing the frequency or extensiveness of a particular phenomenon. Mixed designs are those in which a single investigation relies on both the survey and case study strategies. In general, these designs offer advantages that neither the survey alone nor the case study alone can provide. Four types of project management issues can affect the research design: project staff skills, project organization, resources available, and reporting requirements. Potential implications of these findings are discussed. (BW)

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DESIGN ISSUES IN QUALITATIVE RESEARCH:

THE CASE OF KNOWLEDGE UTILIZATION STUDIES

Robert K. Yin
Margaret K. Gwaltney

August 1982

Abt Associates, Inc.
Washington, D.C.

TM 820 171

PREFACE

This report is the final product from a grant awarded by the National Institute of Education in 1981 (NIE Grant No. G-81-0016). The purpose of the grant was to examine research designs in studying knowledge utilization, and the project was conducted over an 18-month period.

The report is based on an exhaustive review of prior studies of knowledge utilization. Initially, 63 studies were identified as a result of a search process covering existing literature and queries of active investigators. Of these 63 studies, however, only half (or 32) were eventually found to satisfy the definitional criteria for knowledge utilization. The other half (or 31 studies) examined some other topic, related to but not concerning knowledge utilization directly. The primary results of this project are therefore based on the 32 studies of knowledge utilization, and the report describes the various types of research designs and their strengths and weaknesses.

This approach to our study differs from that originally proposed. Initially, we had intended to do an intensive analysis of 16 studies. Due to budget cutbacks, however, this figure had to be reduced to about 12. Later, as our own preliminary work progressed, we realized that a more superficial coverage, but of a larger number of studies, might provide a firmer foundation for future research and action. Thus, our own project was affected by the types of factors discussed more thoroughly in Chapter VI.

The lessons about research designs, drawn from our study, appear to be applicable to the problem of conducting <u>qualitative research</u> more

broadly. Hence, we have chosen a more general title for this report. What the report presents, for the first time to our knowledge, is a description and comparison among the different types of research designs that are possible for doing qualitative research. Although the generalization of our findings from knowledge utilization to qualitative research more generally requires formal corroboratory evidence (as suggested in Chapter VII), the major design issues appear to have a surface applicability to numerous qualitative research topics, and not just those limited to knowledge utilization.

The data collected for our study involved a review of pertinent documents--e.g., research proposals and final reports--as well as intensive discussions with several investigators who shared their insights with us. These investigators were: Judith Larsen (American Institutes for Research, Palo Alto); Peggie Campeau (American Institutes for Research, Palo Alto); Everett Rogers (Stanford University); Allen Parker (Center for Technology and Society, Boston); William Firestone (Research for Better Schools, Philadelphia); and David Crandall (The Network, Andover, Mass.). Each of these investigators described in detail the research design issues that arose in their own knowledge utilization studies. In addition, our project benefited from the advice and encouragement of an informally empanelled group of advisers, including Senta Raizen (National Academy of Sciences, Washington, D.C.); Karl Weick (Cornell University); Irwin Feller (Pennsylvania State University); Judith Larsen (American Institutes for Research, Palo Alto); Robert Herriott (Cambridge, Mass.); and Lee Sechrest (University of Michigan).

A draft of the present report was reviewed by the above-mentioned advisers as well as by Judith Agard (Abt Associates, Inc.), and our NIE

project officer, Rolf Lehming. Dr. Lehming was also helpful throughout earlier stages of the project, and deserves special mention as a particularly enlightened and supportive technical sponsor. Naturally, neither he nor any of the others mentioned are responsible for the findings and conclusions of our report.

The findings from this study have also been presented in other forms. Presentations have been made at the 1981 and 1982 meetings of the Dissemination Research Group, as part of the annual meetings of the American Educational Research Association (AERA). Another oral presentation is tentatively planned for the 1983 AERA meetings, and an abbreviated version of this report will be prepared for journal publication. We have found these opportunities to interact with other investigators, during the course of a project, to be most suggestive in our own work, we highly recommend this type of activity as an adjunct to all research projects.

Questions about this report and related work may be addressed to either author. Robert K. Yin is presently located at The Case Study Institute, Inc., 1730 K Street, N.W., Washington, D.C. 20006 (202-296-6595); and Margaret K. Gwaltney is located at Abt Associates, Inc., in its new offices at 1055 Thomas Jefferson Street, Washington, D.C. 20007 (202-466-4343).

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I. THE FUNCTION OF RESEARCH DESIGNS

Every type of empirical research has an implicit, if not explicit, research design. In the most elementary sense, the design is the logical sequence connecting the evidence--i.e., the empirical data--with the conclusions. More specifically, research tries to satisfy most of the following design requirements (Kidder, 1981, pp. 7-8):

- Construct validity--i.e., the establishment of the appropriate operational measures for the concepts being studied;
- Internal validity--i.e., the establishment of a causal relationship whereby certain conditions are shown to lead to or cause other conditions to occur;
- External validity--i.e., the establishment of the domain to which the study's findings can be generalized; and
- Reliability--i.e., the demonstration that the findings are replicable.

These requirements will prevail in most social science research, even though different disciplines may use different labels for them. However, under certain conditions, one or more of these requirements may not be relevant. For instance, some empirical studies may be descriptive in nature. In such cases the concern over internal validity appropriately might be ignored. As another example, other studies may focus on a narrow set of events or programs, as in a program evaluation, and might therefore not be greatly concerned with the external validity

requirement. Such exceptions notwithstanding, these four requirements generally represent the full range of concerns through which research designs dictate the data to be collected in any given study.

Research Designs in Different Types of Social Science Research

Traditionally, research designs have been documented most formally in experimental and quasi-experimental research. Experiments in the biological and psychological sciences have followed a well-specified set of procedures for determining such conditions as the assignment of subjects to different "groups," the presentation of different stimuli or experimental conditions, and the recording of various responses (e.g., Fisher, 1937; Cochran and Cox, 1957; and Sidowski, 1966). A somewhat independent strand of inquiry has documented experimental designs in situations where only a small number of subjects is available--i.e., "small-n" designs (e.g., Hersen and Barlow, 1976; and Kratochwill, 1978). Such designs must depend upon conditions other than comparisons among groups, because the number of subjects is too small to form such groups. Among the prominent small-n techniques are time-series designs, the use of repeated trials, and most important, replication procedures.

In quasi-experimental research, the investigator has less control in manipulating the experimental conditions. Under such circumstances, yet other research designs are needed, mainly to deal with the internal validity requirement. These quasi-experimental research designs also have become well-known (e.g., Campbell and Stanley, 1963; and Cook and Campbell, 1979), both within academic research and in the policy arena, where program evaluations have been frequent types of studies.

In other social science research--e.g., in history, economics, sociology, and political science--research designs have been less well formalized, although the implicit existence of some design, as a logical model, is unavoidable. A recent development, for instance, has been the emergence of a separate set of research designs intended for use in survey research, in which the conditions for conducting research are different from those in experimental or quasi-experimental science. Thus, the fourth edition of the popular social science textbook on methodological issues--Selltiz et al.'s Research Methods in Social Relations--now contains a separate chapter on the most common designs in survey research (Kidder, 1981).

Overall, research investigators have become more sensitive to the need for specifying the research designs that underlie each individual study. If the basic logical model of the study is flawed, the results of the entire study cannot be accepted. Such a problem will remain even if the study has otherwise been conducted in an exemplary manner. For example, the use of the most precise data collection measures and procedures will nevertheless produce an unsatisfactory study if the research design fails to establish a solid link between the evidence and a study's conclusions.

In spite of this increased sensitivity, however, large gaps in research design development and documentation still remain. Most textbooks only provide an enumeration of a few standard research designs, mainly drawn from the experimental and quasi-experimental literatures, even though some of these texts have been intended for use in social science research in general (e.g., Miller, 1970; and Neale and Liebert, 1980) or in evaluation research (e.g., Rossi, Freeman, and Wright,

1979). Few textbooks even define the generic characteristics of research designs, which would seem to be a minimal first step in promoting better documentation for designs in all of the social sciences, and not just experiments and quasi-experiments. One of the few exceptions is the textbook by Nachmias and Nachmias (1981), which notes that (pp. 77-78):

> A research design is the program that guides the investigator in the process of collecting, analyzing, and interpreting observations. It is a logical model of proof that allows the researcher to draw inferences concerning causal relations among the variables under investigation. The research design also defines the domain of generalizability, that is, whether the obtained interpretations can be generalized to a larger population or to different situations.

In general, these authors also note that the research design is the "blueprint" of research that enables an investigator to identify solutions to four problems: whom to study, what to observe, when to make observations, and how to collect the data (see also Philliber, Schwab, and Sloss, 1980, for a similar list). In the field of evaluation research, another exception has been the work of Fitz-Gibbon and Morris (1978), who describe the general properties of research designs in the following manner (p. 9):

> A design is a plan which dictates when and from whom measurements will be gathered during the course of an evaluation. The first and obvious reason for using a design is to ensure a well-organized evaluation study: all the right people will take part in the evaluation at the right times. A design, however, accomplishes for the evaluator something more useful than just keeping data collection on schedule. A design is most basically a way of gathering comparative information so that the results from the program being evaluated can be placed within a context for judgment of their size and worth.

None of these general guidelines, however, have been sufficient to promote the development of research designs for investigating topics outside of experimental and quasi-experimental settings.

Research Designs for Qualitative Research

This gap is especially evident in relation to a whole set of topics that have come to fall under the label "qualitative research." For the purposes of the present report, such research may be considered to reflect the following conditions:

- An investigation involving a phenomenon--e.g., decision-making--that has no clear boundaries;
- An investigation in which a specific unit of analysis is difficult to identify;
- An investigation where the unit of analysis, though difficult to identify, is nevertheless likely to differ substantially from the unit of data collection; and
- An investigation in which multiple data collection strategies are likely to be used in converging over the establishment of a specific fact, event, or causal explanation.

For each of these four conditions, a contrast between the traditional experimental investigation and the qualitative research investigation may be made.

First, the experimental situation generally involves the identification of a specific set of target variables, with the role of contextual variables held to a minimum. Typically, the classical experiment

investigates a single or small number of variables while holding all other variables constant, by establishing experimental and control conditions. In qualitative research, this procedure is not usually desired, because the phenomenon being studied cannot be divorced clearly from its context, and in fact the boundary between phenomenon and context may not be easily identified (Yin, 1982b). Such a lack of explicit boundaries is one of the conditions that precludes the use of traditional experimental or quasi-experimental research designs.

Second, the unit of analysis may be difficult to define in qualitative research. In experimental research in psychology, in contrast, specific types of human subjects and their measured responses are more readily identified as the units of analysis. These types of units are readily susceptible to the necessary sampling techniques that allow the use of statistical inference. In qualitative research, the unit of analysis is frequently one in which, though seemingly straightforward at the outset, upon further investigation has a poorly articulated definition. For example, program evaluations often assume a clear definition of the intervention, or "program." Yet, on later discovery, the program may defy any operational characterization (e.g., Chartres and Pellagrin, 19 ; and Yin, 1978).

Third, the unit of analysis in experiments also happens to coincide with the unit of data collection. Thus, individual subjects are used to generate measured responses. The responses are then aggregated, in different combinations according to the research design, to produce the critical analytic comparisons. In qualitative research, however, neither a "program" nor a "decision" are units that coincide with any singular unit of data collection, whether the data come from an individual or an

existing record. In other words, the eliciting of responses from a given number of individuals (the units of data collection) will not result in any guaranteed coverage of a pre-specifiable number of programs or decisions (the units of analysis).

Finally, qualitative research generally involves the use of multiple data collection strategies. For instance, interviews, observations, and existing documents may all be needed to converge on a specific set of facts (Yin, 1981a and 1981b). Typically, such issues as "how a decision was made" will involve evidence from all of these types of sources. Each type requires a different data collection strategy, and the merging of evidence from all sources also must occur in a systematic manner. Yet, such merging is a complex process and cannot be considered comparable to the tabulation of data that occurs in experimental and quasi-experimental situations.

All of these differences imply that the well-documented forms of research design--e.g., those in experimental and quasi-experimental research--may not be appropriate for doing qualitative research. The traditional designs are not necessarily poorer or inept; they may simply be irrelevant. However, the identification of those research designs that might be more relevant has not progressed very far. Most books on "qualitative methods" tend only to focus on the methods of data collection, and not on the logic of research designs (e.g., Schatzman and Strauss, 1973; Fiedler, 1978; and Murphy, 1980). This problem also exists with texts that emphasize qualitative methods in evaluation research, in which research design issues are again only minimally covered (e.g., Patton, 1980). On another front, although there is a well-developed debate concerning the relative advantages of qualitative

vs. quantitative methods (e.g., Merton, Coleman, and Rossi, 1979; Cook and Reichardt, 1979; and Smith and Louis, 1982), the debate has not usually touched upon research design issues.

In summary, when investigations involve some type of qualitative research, our knowledge of research designs appears to be limited. Unfortunately, this means that a large gap exists, because numerous topics in both social science and public policy research require qualitative approaches, including: decisionmaking, program implementation, program evaluation, the innovation process, individual and organizational life-cycles, and a wide array of issues in neighborhood change, economic development, interorganizational relationships, and intergovernmental affairs.

Purpose of the Present Study

The purpose of the present study was to initiate a formal description and analysis of qualitative research designs. This was done by indicating how such designs have been used in an illustrative topic, knowledge utilization. The topic covers the process whereby (Lazarsfeld and Reitz, 1975; and Yin and Gwaltney, 1981a):

> Knowledge produced by one person (or organization) is put into use by another person (or organization).

This topic provides an excellent setting for examining research design issues in qualitative research, for a number of reasons.

First, the topic must be studied through qualitative research methods—e.g., no simple set of experiments will provide sufficient insight for explaining how the process works. Second, interest in knowledge utilization has been rising, in part due to the continued

national investment in basic and applied research. This level of R&D effort has led to questions regarding the ultimate utility of R&D-based knowledge, and therefore an increase in utilization has become a priority policy objective. Third, the topic is not one in which formal research designs have been articulated. In fact, the experiences of most research investigators have been in the opposite direction. Most investigators have found themselves forced to develop their own research designs without having an ability to refer to the potentially relevant experiences of other investigators. The low degree of transfer is not the result of a low level of communications among such investigators; rather, the investigators have not developed a common vocabulary or set of principles for discussing research design issues in these settings.

With knowledge utilization research as an example, the following chapters of this report will therefore elucidate the prominent issues in research designs for qualitative methods.

The Organization of This Report

Most reviews of specific research designs are organized according to the logic and potency of the designs (e.g., Campbell and Stanley, 1966; and Cook and Campbell, 1979). Weaker designs are differentiated from stronger ones, mainly on the basis of their ability to cope with threats to internal validity. The resulting catalog of designs is thus presented in a manner that allows an investigator to identify their strengths and weaknesses and to choose among them.

The present review of qualitative research designs was initially intended to mimic the existing presentations of experimental and quasi-experimental designs. However, no strong themes emerged, whereby designs

could be arrayed according to any logical sequence. In retrospect, such an effort must still be considered premature, given the state of the art. However, this observation led to a more important insight: that the classical experimental and quasi-experimental designs all assume a prior step--that the investigator has already selected a research strategy, which is to conduct an experiment. The qualitative research under review, in contrast, was dominated by the use of two other research strategies (Yin, 1981a)--the use of surveys (a paradox that is explained later), the use of case studies, or the use of both.

This insight led to a more appropriate organization for discussing the pertinent design issues, and such an organization dominates the remainder of this report. Chapter II describes the problem of "Defining a Topic in Qualitative Research," a step that is critical and that must occur whether a survey or case study will be undertaken. Chapter III then discusses the issues regarding "Survey-Dominated Designs," Chapter IV the issues regarding "Case Study-Dominated Designs," and Chapter V the issues regarding "Mixed (Survey and Case Study) Designs." Because our review also discovered some important principles with respect to project management factors and their potential effect on research designs, Chapter VI discusses these lessons under the title of "Project Management and Research Design." The summary conclusions of our review are then presented in Chapter VII.

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II. DEFINING A TOPIC IN QUALITATIVE RESEARCH

The initial task in dealing with any type of research--quantitative or qualitative--has to do with the definition of the topic to be studied. In general, this involves distinguishing between a phenomenon and its context, contrasting the features to be covered with those that are to be ignored (Yin, 1982b).

The definitional task should not be approached from the point of view that there is necessarily a singular answer in defining each topic. Every investigation may define a topic in a different manner, depending upon the purpose of the study. For example, common topics of inquiry, such as decisionmaking, public programs, or organizational change, all represent research topics that may be defined in a number of ways. There are limits to the range of possible definitions, however, and these are mainly imposed by the nature of prior empirical inquiry. Thus, to produce a study that contributes to overall scientific knowledge, the definition of a topic should follow some previous theoretical base or earlier empirical inquiry, even if the purpose of the study is to challenge such theories or results. To this extent, a definition should be based on some discussion of prior work on the same topic.

The Phenomenon: What is Knowledge Utilization?

Our own definition of knowledge utilization derived, in a preliminary manner, from the original knowledge utilization problem. This problem has been stated in the following manner (Lazarsfeld and Reitz, 1975): How can research-based knowledge be used in applied settings? Such a question need not be limited to research-based ideas, however. In

many fields, new knowledge can also be created through processes other than "professional scientific inquiry" (Lindblom and Cohen, 1979), and such knowledge has come to be regarded as "craft knowledge." Whether research-based or craft-based, the more general form of the knowledge utilization problem thus leads to the identification of three essential components in the utilization process (see Figure 1):

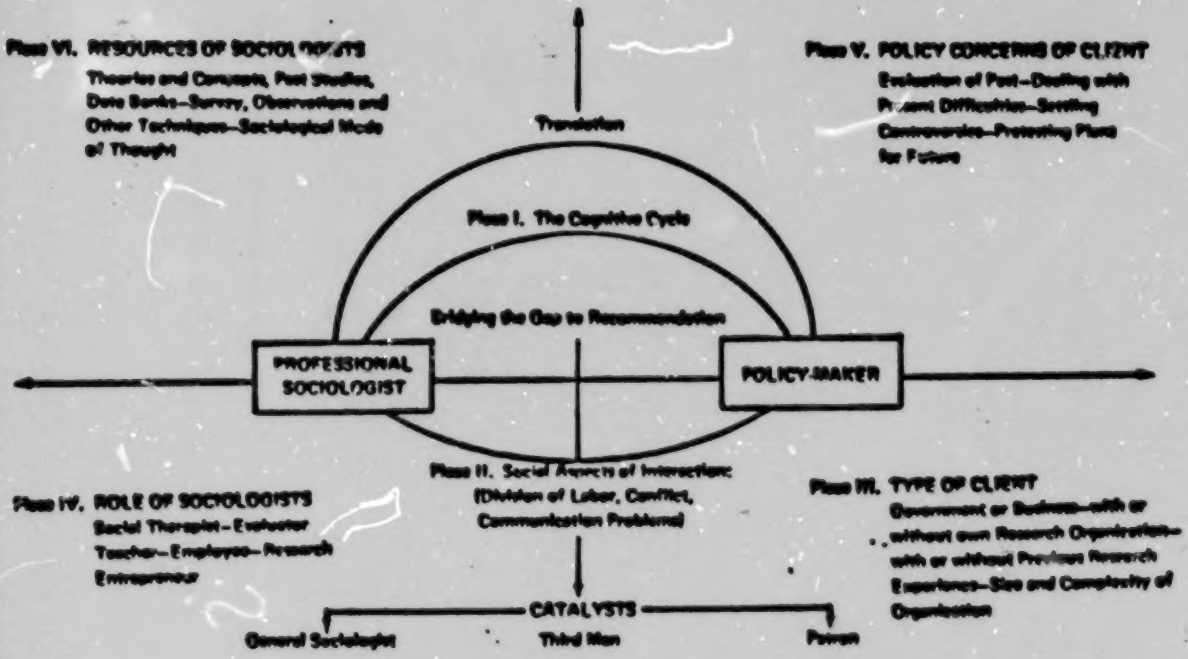
- A knowledge producer, or a party responsible for inventing, developing, or refining new ideas;
- A knowledge user, or a party responsible for applying the ideas in some setting, which may alternatively involve: (a) the making of a decision, (b) the installation of a new practice, or (c) increased enlightenment over a given issue; and
- A communications process, whereby both of the above parties are able to establish and maintain contact with each other.

As thus defined, the key characteristic of the knowledge utilization process is that it involves different parties fulfilling the knowledge producer and knowledge user roles (Yin and Gwaltney, 1981a).

Ignored by this definition are several situations that may be considered relevant in a broader sense, but that are nevertheless not directly pertinent. First, knowledge utilization can be a process that occurs totally within the same individual. A person may invent and develop his or her own idea and then put it into practice. This intra-individual situation, however, is not the same as our problem of getting knowledge when the knowledge producers and users are different parties. Second,

Figure 1

THE KNOWLEDGE UTILIZATION PROBLEM


Phase VI. RESOURCES OF SOCIOLOGISTS
Theories and Concepts, Past Studies, Data Banks–Survey, Observations and Other Techniques–Sociological Mode of Thought
Translation
Phase V. POLICY CONCERNS OF CLIENT
Evaluation of Past–Dealing with Present Difficulties–Settling Controversies–Protecting Plans for Future
Phase I. The Cognitive Cycle
Bridging the Gap to Recommendation
PROFESSIONAL SOCIOLOGIST
POLICY-MAKER
Phase II. Social Aspects of Interaction: (Division of Labor, Conflict, Communication Problems)
Phase IV. ROLE OF SOCIOLOGISTS
Social Therapist–Evaluator Teacher–Employee–Research Entrepreneur
Phase III. TYPE OF CLIENT
Government or Business–with or without own Research Organization–with or without Previous Research Experience–Size and Complexity of Organization
CATALYSTS
General Sociologist
Third Man
Patron

SOURCE: Lazarsfeld and Reitz (1975).

knowledge utilization may occur within the same firm or organization, which might contain both knowledge producing and knowledge using units. The existence of common corporate policies, however, may affect the knowledge utilization process in a different manner than the more common situation, where a research investigator works within one organization (typically, a university) and a knowledge user works within another organization (typically, a private business or a public agency).

Indeed, the essential characteristic of the knowledge utilization problem, as defined here, is that different individuals, located in different organizations, serve as knowledge producers and knowledge users. Under these conditions, knowledge utilization may be considered a process occurring between unlike--or heterophilous (Rogers and Kincaid, 1981)--units. Effective communication is likely to be especially difficult between these two kinds of parties, because they are likely to be members of different professional groups, with correspondingly different networks, norms, and problems (especially if research-based knowledge is involved rather than craft-based knowledge). Nevertheless, as Rogers and Kincaid (1981) have noted, innovation is more likely to occur in such situations, as opposed to the situation in which both parties belong to the same kinds of organizations or professions--i.e., homophilous units.

Search for Knowledge Utilization Studies

This basic definition was used to identify existing knowledge utilization studies. The search for such studies covered a variety of public services, private industries, and types of knowledge. In fact, the search was unconstrained along such lines, only being limited by

two conditions. First, the study had to be based on some original data collection and empirical evidence. Second, the study had to have been identified as a result of several search techniques.

- Citations in existing research studies, including reviews of pertinent literature;
- Identification by various experts in the field, including an expert panel assembled specifically for our study, as well as other investigators around the country;
- Listing among awards made by various federal agencies having special programs on research utilization, the use of new technology, or exemplary practices; and
- Appearance in relevant social science books or journals over the past ten years.

A list of all of the individuals and organizations who were contacted during the course of compiling this list of knowledge utilization studies is given in Appendix A.

This manner of identifying knowledge utilization studies produced some imprecise outcomes. At least half of the studies initially thought to be relevant, by title or even by brief description, did not in fact meet the basic requirements of our definition. An examination and classification of these non-knowledge utilization studies yielded important insights into the structure of the broader literature and hence the context within which knowledge utilization falls. This definition of the context constituted an essential complement to our

earlier definition of the knowledge utilization phenomenon, and thus deserves detailed attention.

The Context: Topics Related to Knowledge Utilization

Our definition had emphasized three components: a knowledge producer, a knowledge user, and a communications process. The studies that did not meet our definitional requirements were those that expressed no specific concern for knowledge utilization and these three components.

For example, one stream of research--on the diffusion of innovations--was in fact ignored by our search. This literature, quite extensive in nature, is primarily concerned with communication patterns among knowledge users (Rogers and Shoemaker, 1962). Among similar types of users--e.g., farmers--some users consistently adopt new innovations earlier than others, and diffusion research has attempted to identify the characteristics of these early adopters as well as the patterns of diffusion under different conditions. However, the research rarely attempts to draw any links to knowledge producers, nor does it give much attention to communication patterns between producers and users.

A second type of non-qualifying study, also prominent in the literature, similarly focuses on user behavior alone, without regard to knowledge utilization. This is the literature on innovations or on organizational change, in which events in a user organization are traced, but these events may not have been the result of the transmission of a new idea. (The studies of this sort that were inadvertently thought initially to be knowledge utilization studies are listed, together with the other non-qualifying studies, in Appendix B.) For example, many changes occur simply because of the availability of new funds or some

other administrative or political initiative. The resulting changes in a local organization may be significant events in an organization's life history (e.g., Yin, 1981c), and specific patterns of implementation may yield significant insights into organizational processes (e.g., Berman and McLaughlin, 1979). However, these issues are not similar to those of concern in knowledge utilization.

Yet a third type of non-qualifying study focused only on knowledge production issues, with no regard for knowledge utilization. Typically, the productivity and creativity of research teams operating in various settings has been a concern in the R&D management literature. The ultimate purpose of such studies is to improve R&D management through such management actions as: the employee recruitment process, changes in the formal R&D organization, or improvements in published communications among knowledge producers. However, this literature gives little or no attention to the ultimate application of any of the research that has been produced. Thus, even where dissemination projects are the initial forces of concern (e.g., Madey et al., 1979), the knowledge utilization process has been ignored if the focus of study has been the knowledge production process alone. Such inattention is in part justified by the fact that much of the research is of a basic nature and intended primarily for communication to other researchers, rather than to any practical setting. (The studies that were found are again listed in Appendix B.)

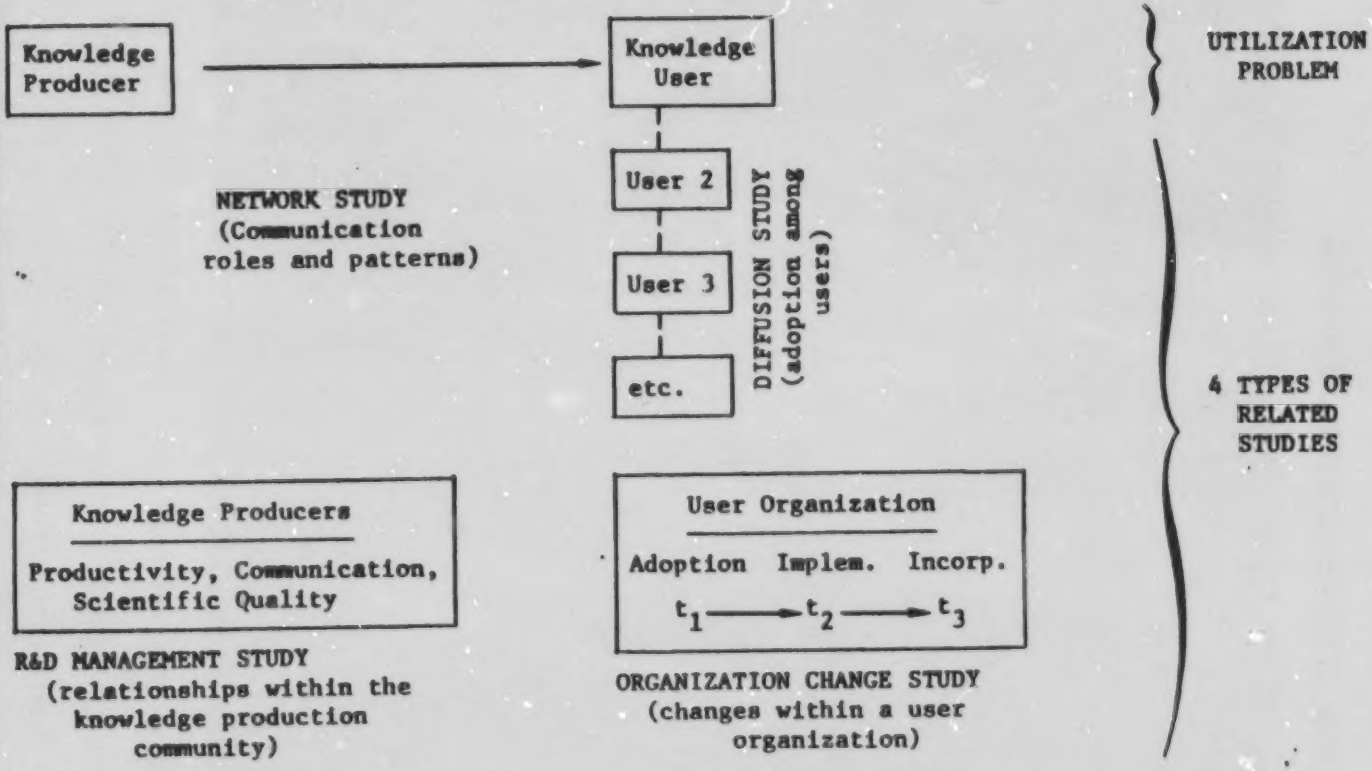
A fourth type of non-qualifying study was readily confused with knowledge utilization studies, but on closer examination also failed to meet the definitional requirements. Such studies focused on networking arrangements, which may have involved relationships among organizations

(e.g., Warren et al., 1974; and Cates et al., 1981) or among individuals (e.g., Sarason et al., 1977; and Sarason and Lorentz, 1979). In one case, a study focused on the role of professional associations as part of a technology-communications system among local service agencies (Bingham et al., 1977). Such a study was not considered a knowledge utilization study because it was more concerned with the health and viability of the networking arrangement, rather than the transmission of specific information from a knowledge producer to a knowledge user. Many of the networks being studied were, of course, knowledge utilization networks--i.e., the purpose of the network was to exchange information about new ideas. However, the study only focused on the general pattern of communications--e.g., what parties communicated most frequently with which others--without regard to any specific utilization experience. (The studies are also listed in Appendix B.)

These four different types of studies, along with the knowledge utilization studies that did meet the definitional criteria, can be depicted in an expanded form of Figure 1. Thus, Figure 2 repeats the core elements of Figure 1, showing the communication of ideas from one party to another; but Figure 2 goes beyond these core elements and shows how the four non-qualifying types of studies are related to these core elements. Essentially, each of the four types represents an expansion of the core elements, but at the cost of ignoring one or more of the other elements and of focusing on some problem other than the knowledge utilization problem. Figure 2 thus illustrates the knowledge utilization phenomenon embedded within its context, as phenomenon and context have been defined for the purposes of the present study. Having defined the distinction between phenomenon and context, we can now proceed and

Figure 2

CONTEXT FOR THE UTILIZATION PROBLEM
(4 TYPES OF RELATED STUDIES THAT ARE NOT UTILIZATION STUDIES)



examine the phenomenon more closely--i.e., examine research design issues with regard to knowledge utilization studies.

Knowledge Utilization Studies Identified

Given our search process and this distinction between phenomenon and context, 32 studies of knowledge utilization were identified. These studies and their characteristics are listed in Table 1 (a full set of citations is given in Appendix C).

Of these 32 studies, the following were the salient descriptive characteristics:

- About 2/3 were published in 1980 or later or were still in progress (see column 1, Table 1);
- About 1/2 covered the field of education, with the other half being distributed among a variety of service or policy topics (see column 2); and
- More than 1/2 relied on a case study research strategy, with the remainder using a survey strategy, for collecting the pertinent evidence (see column 8).

No doubt, the recency of the majority of the studies reflected the increased interest in knowledge utilization in the past few years. Although many studies had been conducted, in earlier periods, regarding the four non-qualifying topics, knowledge utilization can be considered a topic that has only lately received solid empirical attention--in spite of insightful observations made years ago (e.g., U.S. House of Representatives, 1967).

Table 1

STUDIES OF KNOWLEDGE UTILIZATION

Investigator(s)	Year of Final Publication	Service Topic					Research Strategies Used	
		Education	Social & Urban Services	Health & M.H.	Indust.	Other General	Surveys	Case Studies
Alkin et al.	1979	x						x
Bank	In progress	x					x	x
Campeau	1979	x						x
Caplan	1975					x	x	
Chin	1981	x						x
Crandall	In progress	x					x	x
Deshpande	1981				x		x	
DiMaggio and Useem	1979					x		x
Doctors	In progress		x				x	x
Eckfield et al.	1978		x					x
Feller	In progress						x	x
Firestone	In progress	x					x	x
Havelock et al.	1981	x						x
Kennedy et al.	1980	x						x
Larsen	In progress			x			x	
Leviton	1981	x		x			x	
Lingwood	1979					x	x	
Louis and Dentler	In progress	x					x	x
Louis and Rosenbloom	1981	x					x	x
Moore et al.	1977	x						x
Myers and Marquis	1969				x		x	
Parker	In progress	x						x
Patton	1975			x				x
Pelz	1981		x					x
Rogers and Larsen	In progress			x				x
Rothman	1980		x				x	
Sieber	1974	x					x	x
Szanton	1981		x					x
Warnecke	No date			x				x
Weiss and Bucuvalas	1980			x			x	
Yin and Gwaltney	1981	x						x
Yin and Heinsohn	1980			x				x
Yin (R&D Utilization)								

The domination of studies on educational topics was also not surprising. Both of the predecessor components to the U.S. Department of Education--i.e., the Office of Education and the National Institute of Education--have been the most prominent agencies that have supported knowledge utilization research. This inference extends to the other higher frequency topics--urban services and health (and mental health)--reflecting the activities of research-funding agencies such as the National Science Foundation and the National Institutes of Health (and the National Institute of Mental Health), respectively.

What was modestly surprising in this final array was the distribution among research strategies. Even though knowledge utilization may be considered a topic in qualitative research, many studies relied solely upon the use of surveys, and many others used surveys in combination with case studies. Even though the case study strategy was dominant, this high frequency of surveys deserves explicit attention. Thus, the following chapters are devoted to discussions of research designs under three conditions: when surveys dominate (Chapter III), when case studies dominate (Chapter IV), and when both are used (Chapter V).

Summary

From a research design standpoint, this chapter has illustrated the key step of defining the topic of inquiry. The definition began with a link to previous research and theory, indicating the significance of the topic to be investigated--i.e., the knowledge utilization problem. The definition was then applied, through an operationally specifiable search process, to identify various nominations for studies potentially falling within the topic of inquiry.

Further examination then showed how some studies, initially identified, actually fell outside of the topic. These studies focused on some related topic--e.g., organizational change, R&D management, or networking--but did not consider the essential knowledge utilization relationship between producers and users. In this sense, these studies formed one context for the knowledge utilization problem, illustrating how context and phenomenon need to be distinguished, even if in a somewhat arbitrary manner.

Finally, this entire procedure yielded a set of 32 target studies, all of which fit the definitional criteria. The chapter thus illustrates the process of operationally defining a topic of inquiry, and how specific examples of items falling outside of and within the topic can be used to bolster the definitional process. Such an approach, whether applied to an analysis of previous studies (secondary analysis) or to an original empirical inquiry (primary analysis), is a necessary preliminary step in designing qualitative research. The subsequent steps are described in the following chapters.

References to Chapter II

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U.S. House of Representatives, Committee on Science and Astronautics, Applied Science and Technological Progress (Washington, D.C.: National Academy of Sciences, 1967).

Yin, Robert K., "Life Histories of Innovations: How New Practices Become Routinized," Public Administration Review, January 1981c, 24:

Yin, Robert K. and Margaret K. Gwaltney, "Knowledge Utilization as a Networking Process," Knowledge: Creation, Diffusion, Utilization, June 1981a, 2:555-580.

Yin, Robert K., "When Phenomenon and Context Are to be Studied Across Sites," American Behavioral Scientist, 1982b, in press.

Other citations in this chapter may be found in Appendix B of this report (see pp. 82-85).

III. SURVEY-DOMINATED DESIGNS

The use of a survey to collect evidence about knowledge utilization has been a common technique. Table 1 previously indicated that half of the 32 knowledge utilization studies under review had used surveys, with 7 based on survey data alone and another 9 combining surveys with case studies.

On the surface, the use of surveys to investigate a topic such as knowledge utilization would seem anomalous. This is because of the previous characterization of the topic as having no clear boundaries, no easily specifiable unit of analysis, no relationship to a singular unit of data collection, and a need for multiple data collection strategies (see Chapter I). Nevertheless, the use of surveys was found, and survey evidence did contribute to an understanding of the knowledge utilization process. How such a contribution was managed, and the limitations of the approach, are described in the present chapter.

An initial task, however, is to define what is meant by a survey. Three conditions appear to be relevant and were used in our review:

1. The source of information is an individual respondent, who in turn represents the major unit of data collection and data analysis;
2. Each such respondent is selected on the basis of some explicit sampling technique, logic, or is part of a survey of the entire universe; and

3. The data collection is based on the use of a structured instrument, in which each respondent is asked the same questions (which may, however, be open- or closed-ended).

Where these three conditions were not met, the distinctive characteristics of a survey were obscured beyond acceptable limits. Thus, the three conditions appear essential, at least in the present review. Beyond these three conditions, survey technology may (and did) vary considerably.

The following discussion focuses on those situations in which surveys dominated a knowledge utilization study. In other words, surveys were used as the main source of evidence, rather than in conjunction with case studies. Typically, the surveys investigated either knowledge producers or knowledge users, but not both. Furthermore, some surveys also made a prior specification of the knowledge utilization event or medium, while others did not. (Such specification meant that a respondent was asked about a specific report, idea, technology, or interaction that had been identified prior to the onset of the study.) These three approaches represent major types of survey designs, and are described below.

Surveys of Knowledge Producers

As previously noted (see Chapter II), studies that only focused on knowledge producers were not included in our definition of eligible studies to be reviewed. The ineligible studies were those that were concerned only with various facets of the knowledge production process--i.e., R&D management--but not with knowledge utilization.

A few eligible studies, in contrast, limited themselves to data collected from knowledge producers, but aimed at a broader set of questions regarding the entire knowledge utilization process. This was especially found in two of the surveys under review. In the first, Myers and Marquis (1969) interviewed respondents in 121 firms. Each respondent was asked to identify the most significant technological innovation that had been produced by the firm during the most recent 5-10 year period. The interview then continued into the topics of how the innovations had been developed as well as the marketing strategies that appeared to have accounted for success.

The second study involved a survey of research investigators in the U.S. Forest Service (Lingwood, 1979). The personnel were given a self-administered questionnaire and were asked to describe the most effective dissemination strategies for their research. The most frequent response was that the research should be based on some sensing of client needs, and that the research should be conducted in a timely manner.

In both studies, no other data collection effort was made. Thus, the inferences about the knowledge utilization process were based solely on the perceptions of one group of persons--the knowledge producers. No attempt was made to corroborate these perceptions in comparison to other perceptions (e.g., of the knowledge users in the same situation). Similarly, no attempt was made to corroborate the perceptions with the question of how utilization actually occurred, as might be possible by using other types of evidence. Such a characteristic of producer-only surveys must be considered a serious weakness. In fact, without corroboratory evidence, one might even suspect that the producers'

perceptions were not accurate reflections of the actual utilization process, and that any conclusions about the process might be faulty.

Surveys of Knowledge Users

Surveys were also conducted by obtaining information from knowledge users. For example, in a major study of the use of social science by federal policy officials, Caplan et al. (1975) queried 204 high-level officials in federal agencies, asking them for specific instances in which they had used social science knowledge. For each instance of use, the officials were also asked for corroborating evidence, and the quality of this evidence was also taken into account in estimating the extent of use. The results of the study showed a surprisingly high degree of utilization (74 percent of the respondents had at least 2 to 4 instances of use with good corroborating evidence).

This type of design also was used in a survey of social service agencies in England (Rothman, 1980), in which knowledge users were asked about the circumstances in which the findings from some recent report had been put to use. In this situation, utilization involved an application to service practice, rather than to policy decisionmaking (as in the case of the Caplan et al. study), but the basic research design was the same. Similarly, as another example of an application to service practice, but in the business sector, Deshpande (1981) surveyed executives regarding their use of the most recent market research study commissioned by their firm.

In these and other user surveys, three features were prominent. First, the user survey was a good tool for estimating the extent of use of some sort of knowledge. Second, however, the user survey had the

same shortcomings as the producer survey in yielding inferences about the knowledge utilization process--i.e., the survey only brought one set of perceptions to bear on the topic. Third, an additional shortcoming stemmed from the fact that no attempt was made to assure that the knowledge event or medium, as reported by the knowledge users, was the same in all cases. Thus, even such traditional survey items as "user satisfaction" are difficult to interpret, because the collection of knowledge events or media may vary in some unknown fashion. In contrast, where the investigators initially identify a set of specific events or media, more inferences can be made about user satisfaction and the potential implications for the utilization process.

Surveys with Prior Specification of Knowledge Events or Media

This last shortcoming can be overcome by naming specific reports, ideas, technologies, or interactions at the outset of the investigation--i.e., knowledge "events" or media--and then conducting a user survey. Such a design was followed in several of the studies under review.

For example, Weiss and Bucuvalas (1980) surveyed 155 decisionmakers and asked them about each of 50 pre-specified research reports. The decisionmakers' responses covered their degree of use of these reports, their reasons for such use (or non-use), and their other opinions about the reports. Because 50 specific reports had been identified and rated by all of the 155 respondents, Weiss and Bucuvalas were able to compare the results for the same types of reports, and thereby to develop stronger inferences about user satisfaction.

In principle, the naming of a specific array of reports would also have allowed the investigators to compare the user responses to two

other sources of information--the observed characteristics of the reports themselves, as well as responses by those who had produced the reports (knowledge producers). This more potent design was not used, however. Nor was it used in another study in which the data came from knowledge users, but where a prior specification of knowledge events or media also had been made. This study was by Leviton (1981), who surveyed the users of a specific sample of evaluation studies in health care finance and in education; these users had been identified either by the project officers or the research investigators of the studies, but no attempt was made to collect systematic data from these other two sources.

One can only guess at why the more potent design (survey-of-users, combined with survey-of-producers) has not been more frequently found among the survey-dominated studies. To conduct such a study, the most important item is the pre-naming of a specific knowledge event or medium (report, idea, technology, interaction, etc.). Such a named event or medium then allows the investigator to be sure that the users and producers have the same referent when producing their responses. However, one possibility is that this design has not been used more often because of its potential costliness; in general, as shall be shown in Chapter V, this design was found among those studies employing both surveys and case studies, and thus those studies funded at substantially higher levels of effort than the studies covered in this chapter.

Summary: Surveys as a Research Strategy in Qualitative Research

These experiences now permit some tentative conclusions about the use of surveys as the sole research strategy for investigating a qualitative research topic such as knowledge utilization.

With adequate definition, surveys are helpful in determining the prevalence of a phenomenon among a known pool of respondents. Thus, the extent of use is a portion of the knowledge utilization process that can be established through the survey method, even though the topic remains an essentially qualitative one. Other aspects of the utilization process may also be investigated, but only under additional constraints. In particular, if a survey begins with a pre-named event or medium, perceptions of users or perceptions of producers can be aggregated and interpreted. If the same referent is used with both groups, the perceptions of both groups may even be compared with each other.

In general, the survey strategy is therefore appropriate for dealing with either of two aspects of a qualitative research topic: issues of frequency, and issues of perception and attitude. In both cases, however, the use of the survey assumes that individual persons are the most accurate source of information, and one can imagine contrary situations where survey probes might not be sufficient. For instance, the extent of use of a given technology or idea might be reflected in some mechanical rather than human system--as in the amount of computer time spent on a particular program. In such a case, the archival record of the computer time would be the more accurate source of information about the extent of use, but the searching and analyzing of these records would require some research strategy other than a survey. Similarly, the utilization of knowledge in education may involve students rather than teachers as the ultimate "users," yet the most common survey design usually relies on teachers' reports of student behavior, and such reports might again not be the most accurate source of information.

Beyond the issues related to frequency, perception, and attitude, the survey strategy appears to have limited application in dealing with a qualitative research topic. The survey is not the most desirable tool for investigating a behavioral process such as knowledge utilization because the assessment of actual behavior cannot be based on survey evidence alone. In this sense, the survey will rarely yield information that can lead to the design of effective interventions in such behavioral processes. This type of "how" and "why" inquiry, in contrast to the sheer "frequency" inquiry, depends on the use of other research strategies, to which we now turn.

References to Chapter III

All citations in this chapter may be found in Appendix C of this report (see pp. 86-88).

IV. CASE STUDY-DOMINATED DESIGNS

The use of case studies appears to be the most frequent strategy for studying knowledge utilization. Of the 32 investigations reviewed in the present report, 16 used case studies alone and another 9 used case studies in combination with surveys. Thus, about two-thirds of these previous investigations used case studies to examine some aspect of knowledge utilization.

In contrast to surveys, case studies may be considered investigations where the following conditions prevail:

1. No clear boundary exists between the phenomenon being studied and its context--a situation that typically extends the scope of inquiry and that produces more variables than data points--making statistical analysis virtually irrelevant (Yin, 1981b; and 1982b).
2. There are multiple sources of information, including data from individual respondents, on-site observations, and analysis of written documents and other artifacts.
3. To deal in part with the preceding two conditions, data collection is based on a protocol, however formal or informal, which guides the collection of evidence. In a sense, the field investigator is the "instrument," being responsible for translating field information into the response categories required by the protocol (Sanday, 1979; and Herriott and Firestone, 1982).

The frequent use of case studies in knowledge utilization research stems mainly from the match between these conditions and the knowledge utilization process. Because the utilization process is a complex organizational and interpersonal process, the phenomenon is not easily separable from its context. Thus, the process is difficult to trace in a pre-designed fashion, and an investigator may need discretion to pursue new leads as fieldwork progresses. Such leads may require further interviews, observations, or documentary analysis. To conduct this data collection properly, the investigator should nevertheless follow a systematic search-and-corroboration process, and a well-designed protocol is one way of striking a balance between the necessary discretion and desired systematization.

Among case studies, a common design issue is whether to cover a single or multiple case (Yin, 1981b). In theory, a single case, like a critical experiment, can offer sufficient insights and evidence to test a major proposition. However, because case studies cannot be manipulated like experiments, multiple cases need to be used, in part, to provide multiple replications of the same phenomenon, and in this manner overcome some (but not all) of this limitation. For this reason, the simplest type of multiple-case design is a direct replication design (Hersen and Barlow, 1976).

Not surprisingly, all of the case studies of knowledge utilization were of the multiple-case variety. How the case studies were designed, including some comment about pitfalls that may be avoidable in the future, is the topic of the present chapter. Two general types of designs, both of which were applied in multiple-case situations, were found: "holistic

designs and embedded designs. These types are discussed below, followed by a further discussion of multiple-case designs more generally.

Wholistic Designs

Wholistic designs are those in which the case study establishes only minimal boundaries between the phenomenon--i.e., utilization--and its context. The case study is typically about a large organization, such as a school district (e.g., Alkin et al., 1979), or about an inter-organizational arrangement, in which some organizations produce new knowledge and others use it (e.g., Warnecke, no date; Moore et al., 1977; Parker, in progress; and Yin and Heinsohn, 1980). In one other investigation, the case study was about a type of innovative program or package (Campeau et al., 1979).

The main characteristic of the holistic design is that it does not pre-specify a particular type of utilization incident or experience. For instance, the investigation might focus on a general type of knowledge--e.g., the use of tests and evaluation by school practitioners--but make no attempt to define a specific test or evaluation to serve as the referent for the investigation. On the contrary, the investigation would mainly deal with the general relationships among knowledge producers and users. This type of study was done by Alkin et al. (1979), who studied five school districts in which evaluations of Title I or Title IV-C programs had been produced. The resulting five case studies were reported in separate narratives, and the authors used these five cases to derive general conclusions about the utilization process.

When holistic designs are used, a major problem that must be addressed is the potential bias in the data collection activity. Because of the holistic design, a fieldworker has far-ranging discretion in

deciding what events are relevant and irrelevant to the case study. Under these conditions, the fieldworker that does not follow a consistent path of search-and-corroboration may produce an idiosyncratic and biased account of events. An important way of dealing with such potential biases is to have the draft case study reviewed by the major field informants. Normally, these informants are able to call the investigator's attention to some matters that may have been overlooked in the initial data collection. This type of corroboration with the field informants is therefore much more than a matter of professional courtesy; the procedure plays a critical role as a validation procedure (Schatzman and Strauss, 1973, pp. 133-134).

In one of the knowledge utilization studies, great care was taken by the investigators to implement this procedure (Alkin et al., 1979). A distinctive characteristic of this study, in fact, is that the final document contains the actual critique provided by the field informants, as well as a summary of the steps taken by the investigators to deal with these comments. In another investigation (Yin and Heinsohn, 1980), the draft case studies were also reviewed several times by the main informants, who identified missing evidence and incorrect interpretations. Few of the other studies under review indicated how this procedure of using field informants as reviewers was implemented, if at all.

The holistic designs also can lead to another problem that is not as easily addressed. Because the holistic design does not specify, at the outset of an investigation, a limited domain of inquiry, the entire nature of the study may in fact shift. This seems to have occurred in at least one investigation (Moore et al., 1977), which covered six case

studies of technical assistance networks. Each network consisted of an interorganizational arrangement, in which one of the organizations had the role of providing assistance to the other organizations. Although the initial rationale of the study was to investigate the knowledge utilization process, and although the investigators did trace two ongoing assistance projects in each network, the final document tended to focus more on the activities of the assistance-providing organization, and less on the knowledge utilization process. The final conclusions were dominated by concerns over the institutional survival of the assistance-providing organization, including such issues as the auspices for the organization's founding, the nature of the organization's leadership, and the identification of funds for support. Conclusions about the knowledge utilization process were then presented, but only as a lower priority. Overall, each case study had shifted, focusing not on the interorganizational arrangement but on one of the components in the arrangement--i.e., the assistance-providing organization.

Such slippage in the general scope and purpose of inquiry can be addressed, even when wholistic designs are used, in at least two ways. First, the entire case study can be based on an explicit and firmly based theoretical framework--i.e., one positing important causal connections and not merely a description of events (Kaufman, 1958). The Yin and Heinsohn (1980) study, for instance, was about the usefulness of findings from major research projects in the field of aging. The case studies traced the knowlege production process (which occurred in a university setting) and the knowledge utilization process (which occurred in policy-making or service settings). Each case study began with several alternative "models" of knowledge utilization (Weiss, 1979), each

predicting a different set of events. The ensuing case study, though wholistic, had as its main task the establishment or denial of these events. In this way, the models provided a strong theoretical framework, so that the inquiry remained faithful to its original design, even where unexpected events were discovered.

Second, a quasi-experimental design can be used as a partial substitute for a theoretical framework. The Warnecke (no date) study, for instance, covered 7 case studies of health care networks, in which groups of hospitals collaborated to increase the use of certain techniques of cancer-patient care. Each case study followed a pre-post design, in which data were collected before and after a specific intervention--i.e., a formal, collaborative program--had been installed. The nature of the program therefore provided strong guidance regarding the relevant events, and again the inquiry was able to remain faithful to its original design.

In summary, the wholistic design involves the identification of some "site" (organization, interorganizational arrangement, etc.) at which knowledge production and utilization have occurred. A case study strategy is used to examine the events at such sites, but there may be little prior specification of the relevant or most salient events. Under these conditions, the investigator has a wide-range of discretion, during the data collection phase, regarding the events to be pursued and recorded.

To minimize the potential biases in such an inquiry, two procedures may be used. First, the draft case studies can be reviewed by the major informants, to assure that obvious facts have not been overlooked. Second, the case study can employ a strong theoretical or quasi-experimental framework, which will provide additional guidance for the data collection activity. If these two procedures are used, a wholistic

design can be a potent explanatory tool, producing critical insights into how and why knowledge utilization occurs.

Embedded Designs

An embedded design is one in which a smaller unit of analysis is contained (or embedded) within a larger unit of analysis. For case studies of knowledge utilization, the smaller unit of analysis might be a pre-specified knowledge utilization event--e.g., an interpersonal transaction or a particular knowledge utilization service. The larger unit might still be an organization or organizational arrangement, akin to those found in wholistic designs.

Several examples were found, among the investigations under review, of case studies that used embedded designs. In education, three related investigations all covered different kinds of interorganizational arrangements (Chin, 1981; Havelock et al., 1981; and Yin and Gwaltney, 1981b). Each arrangement therefore served as the larger unit of analysis. Within each case study, however, specific types of events or services were identified as smaller units of analysis. For the Chin (1981) study, these were called "transactions," and data were collected regarding the role of the knowledge producers and users in such transactions. In the Havelock et al. (1981) study, a similar procedure was followed, but the conceptual label was an "episode;" and for the Yin and Gwaltney study (1981b), the label was a "service." Outside of education, an embedded design of virtually the same nature was used to study air and water quality services, and knowledge transfer between university and local government (Eckfield et al., 1978). As a final variant, Patton et al. (1975) did case studies in the field of health, in which a specific evaluation study was identified as the smaller unit of analysis.

The embedded design serves as an important device for focusing a case study inquiry, even where a theoretical or quasi-experimental framework may be absent. Furthermore, the smaller units of analysis can often involve numerous discrete events, creating the potential for quantitative analysis within each case study. For instance, one may tabulate the number of transactions or episodes, develop explicit measures of their characteristics, and use multivariate techniques to analyze the data. Such an approach was in fact used in another investigation with an embedded design, which examined local services at 18 sites (the larger unit of analysis) and over 2000 "episodes" of knowledge utilization (the smaller unit of analysis) at all of these sites (Pelz, 1981).

However, one pitfall in using the embedded design is that the smaller unit of analysis may be the only level at which analysis is conducted. This means that the final case studies do not return to the larger unit of analysis, and that no evidence is actually synthesized at the case study level. This situation represents an inversion of the embedded design, and potentially destroys the entire case study design. Thus, the Pelz (1981) investigation made no attempt to synthesize information about the original 18 sites (for each site individually) but effectively became a study of utilization episodes. Similarly, another investigation covered 18 school districts that had been known to have used tests and evaluations successfully (Kennedy et al., 1980). The investigation's major report, however, did not synthesize the information for each district into case studies, and therefore did not try to explain the utilization process as it occurred in any of these districts. Instead, the investigators mainly relied upon their interview data (and ignored

other sources of evidence), and aggregated interviews of like-individuals (e.g., school principals) across sites. The resulting presentation merely provides information about how such like-individuals felt about the utilization process, in a manner more similar to survey than case study analysis. Such a transition, starting with 18 cases but ending with evidence aggregated according to individual respondents, is a mixed type of design that may not take full advantage of either the case study or the survey strategy.

Multiple-Case Designs

The distinction between wholistic and embedded designs pertains to the conduct of individual case studies. In other words, a design may be followed within each case study that is either wholistic or embedded. In all of the knowledge utilization investigations, however, multiple-case studies were conducted. Such situations raise another important facet of case study design--i.e., the problem of selecting an array of cases to be included in a multiple-case study.

Maximizing Statistical Generalizability. Among the studies reviewed, the most common rationale emphasized statistical generalizability, akin to the concern for external validity in experimental and quasi-experimental designs. Cases were selected so that they somehow represented different kinds of situations--e.g., organizations of different sizes, locations in different regions of the country, services to different types of population groups, and the like. Such a rationale was not surprising, because it is frequently used whenever multiple-case studies are conducted, whether on knowlege utilization or on some other topic.

The concern for case study generalizability has mainly been a reaction to the common stereotype of the single-case study, in which

results have been challenged because of their idiosyncratic nature (Kennedy, 1979). Even where robust measures and research procedures have been followed, the single-case limitations appear so severe that the scientific or even policy value of the results has been questioned. Thus, multiple-case studies have been used more frequently in recent years as one response to this problem (Herriott and Firestone, 1982). Depending upon the available resources, investigators may set out to conduct as many case studies as possible, in the hope of maximizing the generalizability of the results.

This rationale is nevertheless weak and not necessarily preferred for multiple-case design. No matter how many cases are included in a study, the number of cases will not be sufficient to reduce the generalizability problem to any substantial degree. This is because each case study represents a complex, multivariate situation. Any sampling plan that includes even such straightforward a variable as "city size," for instance, will be distorted by differences in jurisdictional structure (some "cities" include an entire metropolitan area, while most cities only include the central city), degree of overlap between the organization(s) being studied and the city area (some school districts serve a whole city; others serve only part of it), and other similar complications. In like manner, every facet of a case study will produce a large number of exceptional circumstances in addition to a very large number of potentially relevant variables. Under these conditions, no reasonable number of case studies will enable an investigator to deal effectively with the generalizability problem (Kennedy, 1979).

Maximizing Analytic Generalizability. An alternative rationale was used in one study under review (Szanton, 1981) and represents a potentially

important precedent. This multiple-case design emphasizes generalizability, but to a set of theoretical propositions rather than to a population group. Such analytic generalizability, in contrast to statistical generalizability, is applicable to virtually every case study topic, and not just knowledge utilization (Yin, 1981b; and 1982a).

The multiple-case logic is similar to multiple-experiment logic (Hersen and Barlow, 1976). First, several cases need to be conducted that are direct replications of each other, to establish that a set of results is robust. Second, additional groups of cases can be added, as critical tests of various alternative theoretical positions. For example, the Szanton (1981) study begins with eight case studies, all showing how university groups, in different circumstances, have not been helpful in providing advice (knowledge) to cities. This initial group of cases is repetitive enough to convince the reader of the soundness of the general proposition. The study then attempts to "explain" the reasons for such a dismal record, suggesting next that the academic setting is not the causal agent, as might be expected initially. This proposition is examined through the presentation of a second group of five case studies, all involving independent research organizations that have also had difficulty in providing advice (knowledge) to cities. Yet a third group of cases, not enumerated in detail, correspondingly indicates, however, that university groups have been helpful to other sectors--to businesses, engineering firms, and even federal and state governments. Finally, a fourth group of three case studies, focusing on "change agent" organizations, indicates that advice can be successfully given to cities when the knowledge-producing organization acts as a change agent and is not merely acting as an adviser. The study thus concludes that the advice-giving

process must match the needs of the city governments, which generally require interests in implementation and not merely advice-giving. Given this explanation, university failures to assist cities cannot be attributed to the inherent characteristics of academe. Rather, universities (and nonuniversity groups) will fail whenever a change agent role is shunned.

In all, 16 case studies divided into three groups are enumerated in the Szanton study, with an unspecifiable number represented in a fourth group. This multiple-case design implicitly attempts to provide direct replication within group, and analytic generalizability across groups. What binds the individual case studies together, in logical fashion, is an evolving theoretical argument, much like the logic underlying multiple experiments. Though the Szanton study is not necessarily strong in the other facets of its research procedures, this single example of a multiple-case, replication design is an exemplar of how multiple-case studies can be most effectively designed in other knowledge utilization studies (Yin, 1982a).

Summary

The case study was the most common research strategy used in the knowledge utilization investigations under review. This chapter has discussed the two most prevalent types of case study design, both applicable to the conduct of individual case studies: wholistic designs and embedded designs. Each type has some advantages and disadvantages, but each is able to deal with the entire knowledge utilization process in an explanatory manner. Because all of the investigations under review were multiple-case studies (and not simply single-case studies), two

logical approaches to multiple-case design have also been discussed, the generalizability and the replication designs. The latter was found to be a potentially more fruitful rationale for future studies than the former design.

A major shortcoming throughout the use of all these designs, however, is that case studies alone are not good tools for establishing the frequency or extensiveness of a particular phenomenon. Although great insight was derived into the knowledge utilization process, none of the case studies attempted to assess the degree of utilization that had occurred. This gap is filled well, as Chapter III suggested earlier, by the survey strategy. For this reason, one of the more intriguing types of knowledge utilization studies is that which combines surveys with case studies, and these (mixed) designs are covered in the following chapter.

References to Chapter IV

Herriott, Robert E. and William A. Firestone, "Optimizing Description and Generalizability through Multi-Site Qualitative Research," paper to be published in Educational Researcher, 1982.

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Yin, Robert K., "When Phenomenon and Context Are to be Studied Across Sites," American Behavioral Scientist, 1982b, in press.

Other citations in this chapter may be found in Appendix C of this report (see pp. 86-88).

V. MIXED (SURVEY AND CASE STUDY) DESIGNS

As noted throughout the previous chapters, nine of the 32 studies used mixed designs, in which both surveys and case studies existed as research strategies. These nine studies should be augmented by a tenth study (DiMaggio and Useem, 1979), which we originally classified as an investigation that relied solely on case studies (see Table 1), but which in fact was a follow-up to an earlier study that was based on a survey strategy. In this sense, the study was in fact part of a mixed design, and ten studies therefore serve as the basis for the present chapter.

Mixed designs are potentially the most comprehensive designs, because they enable an investigation to address different sets of questions, which Chapters III and IV have shown to be complementary. The survey strategy can provide information about the frequency of a phenomenon and about the perception and attitudes of key individuals (Chapter III); the case studies can provide insight into the "how and why" of a complex process (Chapter IV). Moreover, mixed designs may be considered more sophisticated than either the survey-dominated or case study-dominated designs, if only because the mixed designs attempt to synthesize the survey and case study strategies.

Nevertheless, the management and implementation of mixed designs can be difficult. A level of resources is required that goes beyond the simple survey or case study strategies, and these resources must be integrated in a productive and timely manner. Possibly for this reason, investigations with mixed designs can be costly and can take several years to complete. And not surprisingly, the ten studies under review include the most expensive of all 32 investigations under review, with

several having been funded at a level of $400,000 or more, and with one study having involved $2.8 million.

Four types of mixed designs were found and are discussed below. These are: parallel designs, sequential designs, cases-within-surveys designs, and surveys-within-cases designs.

Parallel Designs

A parallel design is one in which the case study and survey components of an investigation are not really integrated in any technical sense. Although each effort is aimed at a set of conceptual objectives that may be complementary, each effort is undertaken rather independently, in terms of internal design and instrumentation. In other words, the units of analysis, measures, and analytic comparisons are different and cannot be aggregated or compared in any analytically formal manner, such as the techniques described by Glass, McGaw, and Smith (1981). However, the parallel design may involve varying degrees of managerial integration, in which investigators involved in one component develop their plans, and later their conclusions, in consultation with each other. In this latter regard, the investigations under review varied.

For example, one study of the utilization of urban technologies in fact consisted of nine substudies, according to the original design plan (Doctors et al., 1979). Each of these nine substudies appeared as a separate investigation, with its own research objectives, design, and data collection plans. In particular, one substudy, relying more heavily on survey methods, compared the benefits derived at 27 sites (as a result of the availability of technology assistance) with a "control" group of 27 non-assisted sites. This substudy was to result mainly in a cost-benefit analysis, indicating the advantages, if any, of using the urban

technologies. A second substudy, relying more heavily on case study methods, focused on 15 innovations, to determine how and why change occurred with these innovations, including the investigation of knowledge production and knowledge utilization factors. Presumably, each of these case studies could include events occurring at more than a single site, because the same innovation might have been used at more than one site, and in this sense the survey and case study designs involved different units of analysis. The degree to which the investigators of these different substudies consulted each other is not known, so the overall study may have remained a collection of substudies.

As a second example, a large-scale study of knowledge utilization in education also involved a number of separately identified substudies:

- A study of federal and state-level programs and knowledge production activities;
- A study of one specific program (the National Diffusion Network), designed to produce and utilize new knowledge created by practitioners;
- A study of the behavior and attitudes of external change agents, or linkers;
- An analytic effort designed to serve in a formative evaluation mode, to assist school districts;
- A study of 145 school districts and the knowledge utilization in these districts in relation to specific innovations; and
- An ethnographic study of 12 school districts, selected from the larger pool of 145 districts.

Initially, five or these substudies were to be designed and conducted by different research organizations, each operating as a subcontractor to the prime research organization--which was also responsible for the conduct of the first substudy listed above. Technically, the studies appeared to be independent of each other at the outset. However, for the major survey and case study substudies (the last two on the above list), collaborative activities increased over a period of time, largely on a managerial basis. The investigators responsible for one substudy began to exchange findings and tentative conclusions with the investigators of the other substudy, and this resulted in mutual insights and an intellectual debate about the knowledge utilization process. Although no technical synthesis occurred, the final presentations of both substudies were substantively enlightened by these interactions.

Another way of compensating for the lack of technical integration in a parallel design is for the same investigators (or principal investigator) to be an active participant in the relevant substudies. Under these conditions (e.g., Bank, in progress; and Sieber, 1974), the final conclusions of the master study can reflect evidence from both the survey and case study efforts, even though each effort may have been conducted on the basis of separate technical designs.

Sequential Designs

A sequential design still falls short of a technically integrated design. However, the case study and survey components are more tightly concerned with complementary research objectives, and one of the components is deliberately undertaken first, with the major goal of informing the design of the other component.

The general advantages of using surveys and case studies in this complementary manner have been discussed in greater detail elsewhere (Sieber, 1973). As but one possibility, case studies can be used to reduce an initially unstructured inquiry into a focused set of measures, which then can be applied in designing a survey. Alternatively, a survey can be used to identify the distribution of a set of conditions, and thereby serve as a "universe" against which a new set of case studies can be selected. Of course, a more complex sequential design may involve more than a single iteration between case studies and surveys, as a string of such iterations may occur as part of the same investigation.

The investigations under review revealed no major new lessons along these lines. The main finding was that sequential designs were indeed among those used to investigate knowledge utilization, and that both the survey-first and case study-first sequences could exist. In one investigation, the initial phase of the investigation involved an exploratory set of case studies (Louis and Dentler, in progress). One purpose of the case studies was to define the most pertinent units of analysis for further investigation. For example, although the investigators knew that they eventually wanted to analyze the experiences of a set of knowledge utilization "projects" sponsored by the National Institute of Education, the operational definition of these projects lacked the clarity needed to design a survey of the projects' participants. The case studies were undertaken to assist in this definitional process, and the survey will be conducted in a subsequent phase of the full investigation.

In another study, the initial phase included a survey of organizations involved in the agricultural knowledge utilization process

(Feller et al., in progress). Many different organizations participate in a complex manner in this process, with their roles covering knowledge invention, development, transfer, and utilization. One purpose of the organizational survey was to define these roles and to identify a specific set of interorganizational networks--dealing with the same technology--each of which could later serve as the subject for a case study. Thus, the later phase of this investigation will involve the design and conduct of ten case studies of interorganizational networks; the definition of these networks would not have been possible without the earlier survey work.

These two examples indicate how sequential designs can be used to investigate knowledge utilization. The results of the survey and case study components cannot be integrated in any formal, analytic sense, but the two components are much more closely related than in parallel designs. Managerial integration can also be used to further tighten this relationship; with the above two examples, both sets of principal investigators are intensively involved in both the survey and case study phases of their respective investigations, and this will create further interaction between the two phases. In general, the sequential design begins to resemble an integrated design, and the overall investigation appears less as a collection of substudies than does the parallel design.

Cases-within-Surveys

Chapter III showed how surveys call for information to be collected from knowledge producers, knowledge users, or both. Furthermore, if the survey is based on the prior identification of a specific knowledge utilization event or medium, the producers and users can be asked to

comment on the same experiences, and the investigator can compare the responses from both types of parties.

In either of these situations, the knowledge producers and knowledge users may be part of the same "site"--e.g., an interorganizational network, a complex organization such as a school district, or even the same geographic area. To understand how and why events occur at this type of site, a case study can be used. The case study therefore intensifies the investigation at one (or more) of the survey sites, and in this sense the case study is designed to exist within the survey.

This type of intensification occurred in one of the studies under review (DiMaggio and Useem, 1979). The investigation dealt with 25 case studies, with each case study being defined as an interorganizational connection whereby market research knowledge had been produced and used (or failed to be used), in assisting museums, theaters, and other arts organizations. Each case study involved unstructured interviews with key participants--e.g., the director of the market research effort and the head of the arts organization intending to use the results. All 25 cases were part of a larger pool of market research projects, however, that had been the subject of an earlier survey. The survey had focused on the relationship between the skills of the market research team and the quality of the final research effort (and hence would have been classified as an R&D Management study according to our definitional criteria in Chapter II). The investigators felt that the survey had not penetrated utilization issues, and therefore designed the follow-up set of case studies.

Under these circumstances, the case studies can indeed provide evidence concerning the knowledge utilization process. But because the case studies are part of a larger pool of sites, the results also can be

generalized to include estimations concerning the frequency of occurrence of the various case study outcomes. In other words, when case studies are embedded within surveys, the overall investigation can provide information regarding both the process and the incidence of knowledge utilization. Compared with experimental research designs, such a combination of results begins to approach the analytic requirements for establishing both a causal pattern of events (internal validity) and a framework for knowing the statistical generalizability of the results (external validity). This type of mixed design is therefore much more comprehensive and integrated than the those previously described (parallel or sequential designs). Furthermore, this type of mixed design is more comprehensive than any of the survey-dominated or case study-dominated designs described in Chapters III and IV. Unfortunately, more examples of this case-within-survey design were not encountered in our review.

Surveys-within-Cases

The opposite design is also possible, in which several case study sites are first identified, and widespread survey efforts are undertaken at each site. The case studies can still retain their distinctive identity under these conditions, because conclusions about a site's experiences may be based on several sources of evidence, of which they survey results are only one part. However, if the survey evidence alone is aggregated across sites (e.g., by type of respondent), and no attempt is made to integrate the evidence within site, a survey-dominated design is actually at work. In sum, the surveys-within-cases mixed design must include some integration of evidence at the site level (again, a "site"

can be an interorganizational arrangement, a large and complex organization, a geographic area, etc.).

The surveys-within-cases design was used in three major studies of knowledge utilization. One study covered 39 community mental health centers and their utilization of new knowledge provided by an external consultant (Larsen, in progress). Surveys were conducted of the major participants in this process, with reference to specific knowledge utilization events, and the investigation uncovered about 800 interactions concerning the utilization of specific "pieces of information." In the analysis phase of the investigation, the survey results were examined across sites, so that comparisons were made among a large number of knowledge producers (consultants) and knowledge users (staff of the community mental health centers). However, the investigation also collected organizational information about the 39 centers, and this information was integrated with the survey results from each site, so that 39 case studies could in principle have been completed.

A similar surveys-within-cases design was followed in a study of educational networks, in which surveys of key personnel were conducted at 23 sites (Firestone, in progress). The analytic efforts also included a cross-site aggregation of survey data and a within-site integration of information from sources of evidence, not limited to the survey.

The surveys-within-cases design creates two key problems that must be overcome to be successfully implemented. First, even where the investigation is aggregating the survey evidence across sites (a step that seems easy to do, given existing techniques of survey analysis), the mixed design can lead to an unequal distribution of respondents across sites. "Larger" sites are likely to have had more participants interviewed than

"smaller" sites, and the resulting aggregate evidence must compensate for this disparity through some weighting procedure. The weighting procedure, in turn, may cause additional difficulties not anticipated by the investigators. Second, the survey and nonsurvey evidence, within site, must be integrated through some formal procedure, otherwise there will be insufficient assurances regarding the potential over- or under-reliance on the various sources of evidence. Neither of the two above-mentioned studies had developed, at the time of our inquiry, fully satisfactory procedures for dealing with either of these two problems.

Another study under review was able to address, to a large extent, the second problem--of integrating survey and nonsurvey evidence within site. In this study, about 90 school districts had been the subject of various types of data collection, ranging from surveys of key participants to field observations to case histories produced by a "site documentarian" (Louis and Rosenblum, 1981). To integrate this whole array of evidence, the investigators created a meta-research instrument, called a Consolidated Coding Form. One such form was to be completed for each of the 90 sites, by a member of the investigating team who had access to all the sources of evidence about the site. The Consolidated Coding Form thus served, in a way, like a case study protocol, except that the integration of evidence had to rely on data that had already been collected. The Consolidated Coding Form then became the basis for reporting both the within-site findings and cross-site trends. Such an approach may therefore be regarded as but one attempt to deal with the problem of integrating survey and nonsurvey evidence, when the surveys-within-cases design is used.

Overall, should these two problems be surmountable in the future, the surveys-within-cases design also offers some advantages over other research designs. The surveys can become the basis for assessing the frequency of events within a given site, while the cases can be used to develop insights into the knowledge utilization process at each site. Across cases, a multiple-case replication design (see Chapter IV) can still be used, and the entire investigation can be used to develop analytic rather than statistical generalizability.

Summary

Mixed designs are those in which a single investigation relies on both the survey and case study strategies. In general, these designs offer advantages that neither the survey alone nor the case study alone can provide. Mixed designs can therefore be the basis for a more thorough investigation of knowledge utilization.

Several types of mixed designs have been identified and were used in the studies under review. The variations cover situations in which there is no analytically formal integration of survey and case study evidence (the parallel and sequential designs) to situations in which such formal integration is possible but difficult (the cases-within-surveys and surveys-within-cases designs). Our discussion has indicated some of the experiences that others have had with these designs, including the problems that they have encountered. Nevertheless, when properly executed, the latter two designs may be far more preferable than the parallel and sequential designs, and investigators may want to make greater use of the preferable designs in the future.

However, the choice of the ultimate research designs is not always under the full control of the research investigator. In fact, external

forces may be so strong that the final research design is highly constrained before the investigator has an opportunity to explore fully all of the possible alternatives. The next chapter deals with some of these external forces.

References to Chapter V

Glass, Gene V., Barry McGaw, and Mary Lee Smith, Meta-Analysis in Social Research (Beverly Hills: Sage, 1981).

Sieber, Sam D., "The Integration of Fieldwork and Survey Methods," American Journal of Sociology, May 1973, 78:1335-1359.

Other citations in this chapter may be found in Appendix C of this report (see pp. 86-88).

VI. PROJECT MANAGEMENT AND RESEARCH DESIGN

In theory, a research design should be constructed solely on the basis of technical considerations. The preceding chapters have described some of these considerations in studying knowledge utilization, whether surveys or case studies have been selected as the desired research strategy.

However, nontechnical considerations also can affect a research design. These include issues of:

- Project staff skills;
- Project organization;
- Resources for conducting the research; and
- The organization and timing of reporting requirements for communicating the research results.

In many cases, these nontechnical considerations are directly under the control of the research investigator; but in cases of "procured" or sponsored research, an additional set of influential persons includes the staff of the R&D-funding agency (Yin, 1980).

Our review of knowledge utilization studies revealed a surprising degree to which these nontechnical considerations could affect research designs. Furthermore, few persons appear to be aware of these relationships. Typically, the nontechnical considerations are viewed from a managerial perspective alone, on the erroneous assumption that management choices can be made without affecting the technical design of a study. The purpose of the present chapter is therefore to identify some of these relationships, and to indicate how certain seemingly unobtrusive choices--whether in designing a Request for Proposals (RFP) or in planning and

organizing the actual research project--can actually have a large impact on the research design of a study. Because this type of information has not been well-documented within the formal reports of research investigations, much of the evidence for this chapter comes from two supplementary sources that were examined as part of our study: interviews with principal investigators and analyses of RFPs or other research solicitations that led to a knowledge utilization study.

Project Staff Skills

The training, experience, and qualifications of a project staff will affect all aspects of a research project. Not surprisingly, the identity of the key investigators is a key variable in the consideration of research awards, whether such awards are grants or contracts.

Where research solicitations attempt to specify the desired qualifications of the key project staff, attention is typically given to substantive skills. For instance, some RFPs give general descriptions of the types of research experiences that might be relevant:

> . . . To plan, conduct, and complete this study [of federal and state dissemination strategies] successfully, offerors will have to provide staff who, together, have technical expertise and knowledge in the areas of diffusion, program evaluation, research design, instrument development, field data collection, statistics and sampling. Offerors are also encouraged to supplement their staffs with persons who have done similar work in disciplines outside of education (e.g., sociology, anthropology, social psychology, political science, communications). . . . The proposed project director should have expertise in planning and managing evaluation studies. (RFP OE-78-100)

Similarly, unsolicited proposals will emphasize the previous experience of the proposed investigators, in relation to the topics proposed for further investigation.

This emphasis tends to underplay the methodological training of the proposed investigators. Although every investigator may have an ability to deal with a wide range of research methods, most investigators will have been trained in academic departments with dominant methodological leanings. For instance, sociologists trained at the University of Michigan, especially with exposure to research projects at the Institute for Social Research, will tend to be best acquainted with survey methods as the primary means of gathering evidence. These methodological proclivities are not necessarily related to specific academic disciplines. In addition, the proclivities may change over time at the same academic department, so it becomes important to know when someone studied at a particular department, and not just where he or she studied.

This methodological dominance will mean that, ceteris paribus, an investigator will favor different types of evidence in designing a knowledge utilization study. As indicated previously in Chapters III, IV, and V, this orientation is therefore likely to lead to the selection of some designs and not others. Among the studies under review, an expected observation was the finding that those trained previously in surveys tended to use surveys in their investigations, whereas those trained in case studies tended to use case studies.

The obvious effect of an investigator's methodological orientation need not be belabored. The salient point for this report, however, is that such methodological orientations are rarely identified as an explicit component in judging an investigator's qualifications for conducting knowledge utilization research. Whereas an investigator will therefore be selected to participate in a research project on the basis of substantive experiences and knowledge, in fact the choice will also

(unknowingly) affect the research design because the investigator will also have a particular methodological orientation. In this manner, the selection of project staff will affect the research design of the ensuing project.

This same principle may be extended to the identity of the specific research organizations and academic departments that are to be the grantee institutions (or contractors) for a given study. Some institutions may have a normative preference for certain kinds of methodological approaches, and the research team may be responsive to such norms. Many organizations and departments, of course, can support the full variety of methodological approaches, so that this institutional factor, while relevant, probably has only a minor effect on the research design in most cases.

Project Organization

The traditional research project may be considered a unified research team, usually composed of fewer than three or four individuals, working collaboratively on the entire project.

Several of the knowledge utilization efforts under review, however, were sufficiently large that a more differentiated organizational pattern was needed. Under these conditions, research teams had at least three choices, all of which were found among the studies reviewed. The first pattern was to emulate the traditional research project, even though the research team might have been composed of five, six, or even more members. This pattern called for intensive interactions among the members of the team, including weekly meetings and daily working relationships; all members shared equally among the various research tasks.

The second pattern was to decentralize the staff into several components, with various subgroups--e.g., two or three persons--responsible for various facets of the research project. This pattern allowed for some functional and methodological specialization among the facets, and was more likely to satisfy professional needs for individual recognition, in contrast to the first pattern (in which no single member specializes on any given topic or methodology).

The third pattern was an extension of the second, but involved the use of multiple organizations--e.g., subcontractors. Under this pattern, the components of the research project were likely to assume the nature of "substudies," with an independent research objective, design, and data collection effort of their own. The original research project could lose its own technical coherence and identity, becoming instead an administrative and managerial unit for integrating the substudies.

None of these patterns is necessarily the correct or desired pattern for all knowledge utilization studies. However, each pattern is likely to favor a particular research design. For example, the more decentralized patterns are clearly likely to result in the use of one of the mixed designs--the parallel design--when both case studies and surveys are to be conducted. Solicitations that (knowingly or unknowingly) encourage the creation of managerial substudies and independent research teams within the same investigation are therefore favoring parallel designs. Similarly, solicitations that attempt to reduce time gaps by calling for case studies to be completed while the project team awaits field clearance for its surveys may be indirectly favoring sequential designs.

As another example, one of the underlying principles revealed in the previous chapters has been the degree to which a knowledge utilization

study integrated information from knowledge producers and users. When either the second or third--i.e., decentralized--patterns of project organization are used, the result is likely to be a design in which different aspects of the knowledge utilization process are initially examined separately. Different efforts will be mounted to investigate the role of knowledge users, the role of knowledge producers, the role of intermediaries (if any), and the type of knowledge being utilized (e.g., Louis and Rosenblum, 1981; Crandall, in progress; and Doctors et al., 1979). The project may ultimately draw together the lessons from these separate components, but the initial fragmentation can potentially lead to incompatible terminologies and research operations, making the final synthesis more difficult. In any case, the disparate efforts are not likely to reflect a singular research design.

Once again, although the nature of a project's organization can affect the research design in this manner, the nature of the organization is often dictated by nontechnical factors and the overall level of resources. In addition, it should be noted that the type of project organization is not necessarily controlled entirely by the research team, as certain preconditions may have been implied in the original research solicitation or RFP.

Resources for Conducting the Research

The overall level of resources available to do a study will also affect the research design, especially if the study is supposed to cover a minimum number of sites or data points. The lower the resources in relation to the number of sites or data points, the more the study will be limited to survey designs. This is because surveys can be used to

cover the necessary sites or data points, even if the evidence is somewhat superficial. In extreme cases, the surveys can use low-cost mailing or telephone techniques of data collection. By comparison, even though "mini-case studies" can be designed at low cost, the travel expenses general required to conduct case studies will still mean that the survey method will yield a higher number of sites or data points. Finally, as pointed out in Chapter V, mixed designs are likely to require the greatest investment of resources.

The level of resources available can affect the research design in another way. To the extent that the resources dictate the use of less experienced research personnel for conducting fieldwork, any case studies are likely to be problematic, and some type of survey design may be more preferable. Thus, the wholistic case study design especially requires the use of experienced and senior investigators, who often spend considerable time at a site (e.g., Alkin et al., 1979). Moreover, the wholistic design may exist as part of a mixed design--e.g., the cases-within-surveys design. In contrast, when a case study design is not implemented by experienced field investigators, the pursuit of new leads in the field as well as the final assembling of the case report may be problematic.

As a further note, this difference between experienced and less experienced investigators in collecting field evidence is in fact a more general difference between survey and experimental investigations on the one hand and case studies on the other (Yin, 1981b). In the first two research strategies, data collection is best conducted when the investigator has a minimum of individual discretion--e.g., the ideal survey interviewer will follow a strict protocol for giving instructions and eliciting responses. In the case study strategy, however, a fieldworker

must have a full understanding of the substance of the investigation, so that discretion can be exercised intelligently and systematically, to take advantage of new information that may arise during the data collection effort.

The Organization and Timing of Reports

In traditional research projects, there may be little correspondence between the organization and timing of final reports--typically taking the form of journal articles--and the way in which the research was organized. The more experienced research investigators maintain a stream of publications that draw from various research projects, many of which may have been completed a while ago. To this extent, the reports clearly follow the conduct of the research, and the reports do not affect the research design.

However, most knowledge utilization studies result in one or more reports about the research, with some reports being produced before the research is completed. This emphasis is often the result of a need to show interim progress on a lengthy study, or possibly to serve the early information requirements of a particular audience. Under these conditions, two types of interim reports may be prepared. The first is a full progress report, capturing the complexity of a research project and touching upon likely trends and patterns, but in a manner dictated by actual events (and actual progress). The second is a truncated progress report, based mainly on the completion of a specific data collection effort or the work of a substudy component. In this latter situation, the reporting requirements may have the effect of fragmenting the research design.

For instance, in a study using a mixed design, if separate interim reports are required for covering the results of a survey and the results of a set of case studies, this is more likely to lead to the use of the parallel design, so that the research team has a higher chance of complying with the interim reporting requirements. Even though a later requirement may specify the integration of the survey and case study evidence, the integrative effort may only be mounted later in the study, rather than being an integral part of the original design. In several of the knowledge utilization studies under review, this type of fragmented reporting structure was typically required by an R&D-finding agency that had "contracted" for the research.

In contrast, where investigations were based on the awarding of research grants (e.g., Larsen, in progress), progress reports were frequent but wholistic. In addition, the principal investigator repeatedly used oral briefings to keep the R&D-funding agency apprised of the project's progress. This integrative reporting requirement, however, meant that the technical coherence of the project's overall research design could be maintained. All sources of evidence were used to arrive at major conclusions, throughout the effort; and the final report was but the culmination of this process, and not based on a special integration of findings occurring at the end of the project only.

Summary

This chapter has suggested that four types of project management issues can affect the research design of a knowledge utilization study: project staff skills, project organization, the resources available, and the organization and timing of reporting requirements.

In most cases, the decisions about these managerial aspects of conducting research have not been explicitly linked with the potential effects on a research design. In fact, project management issues are usually decided according to a managerial perspective that is disassociated from the technical design process, and the potential relationships between project management and research design are not likely to be appreciated.

To gain a fuller insight into the possible strength of this relationship, one may consider the reverse order of decisionmaking. Normally, the project management issues are settled first, either because of the constraints of the R&D-funding agency's resources or because of certain decisions in designing research solicitations. However, the research design could alternatively be stipulated first. If it were, the project management factors would in turn be dictated by the research design, but would likely entail a much wider variance than R&D-funding agencies or research organizations might tolerate. Because project management issues must therefore be settled first in most cases, the decisions do affect the research design, and the purpose of this chapter has been to suggest some of the ways in which these effects have occurred in knowledge utilization studies.

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RFP OE-78-100 (full citation to be added later).

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Other citations in this chapter may be found in Appendix C of this report (see pp. 86-88).

VII. CONCLUSIONS ABOUT QUALITATIVE RESEARCH DESIGNS

Our study has used the knowledge utilization process to illustrate the problem of designing qualitative research. Four major aspects of research design have been considered:

- The problem of defining the topic to be studied;
- Designs that are dominant when survey methods are used;
- Designs that are dominant when case study methods are used; and
- Mixed designs, in which surveys and case studies are used in a complementary manner.

As a result, our study has identified a number of research designs that have been used in 32 previous investigations of knowledge utilization, covering a range of urban services and policy applications.

What was most revealing was that there seem to be a limited number of designs. The 32 previous investigations produced a uniform pattern, regardless of the specific service being examined. Our guess is that future investigations may also be limited to these designs and that the major contribution of our own study will have been to begin the codification of qualitative research designs.

Our study also indicated a few ways in which project management choices can influence the design of a qualitative research study. In particular, project staff skills, project organization, the level of resources, and the nature of reporting requirements can all affect the research design of a study, even though these management aspects are generally considered independently of the technical design of a

study. In some situations, the project management factors will affect whether surveys or case studies are likely to be chosen as the major strategy for collecting data; in other situations, the project management factors can affect the degree of coherence or fragmentation in the overall research design.

These general findings provide a framework for categorizing and analyzing qualitative research designs. Such an effort has been rarely attempted in the past, and the study's findings can therefore assist research investigators and R&D-funding agencies in designing future qualitative research. As a descriptive effort, the findings hopefully serve a useful purpose already.

The purpose of the present chapter, however, is to explore beyond the descriptive stage, and to speculate about the potential implications of our findings. In particular, we would like to consider whether the findings can truly be generalized beyond the topic of knowledge utilization, and whether the findings lead to any suggestions for intervening in the design process--a step that assumes some understanding of the causal links in the design process. These topics are discussed in the remainder of this final chapter.

The Generalizability of the Findings

The search process described in Chapter II led to the identification of numerous empirical studies, each appearing at first to be a study of the knowledge utilization process. After further examination, only about half of the studies actually satisfied our definition of the knowledge utilization process--i.e., that an investigation had to be concerned with the communication of knowledge from one party (a knowledge producer) to another party (a knowledge user). The nonqualifying studies

emphasized some related topic--e.g., diffusion, organizational change, R&D management, or networking--and Chapter II showed how these related topics could be considered one context for knowledge utilization research.

Our search process was exhaustive and extensive. Numerous printed and personal sources were consulted. Thus, we believe that the studies ultimately identified as knowledge utilization studies do represent the overwhelming majority of studies on this topic. To this extent, we believe our findings to be fully applicable to the problem of designing research on knowledge utilization. However, the initial purpose of this report was to deal with the problem of designing qualitative research in general, and not just to limit our findings to the topic of knowledge utilization. To what extent has this broader purpose been served?

A quick perusal of other qualitative research topics--e.g., program management, neighborhood development, family or cultural interactions--suggests that the essential design characteristics identified in this report are applicable to these other topics as well, with one possible exception. The potential match is good because both surveys and case studies appear to be the dominant research strategies for studying these other topics in qualitative research, and the subcategories of designs (e.g., the wholistic case study vs. the embedded case study) seem to characterize these other topics as well. Some translation may be needed for the survey designs, where various population groups (depending upon the topic being studied) would have to be substituted for our use of "knowledge producers" and "knowledge users." Nevertheless, the findings regarding the advantages of surveys--to establish the degree of prevalence of a phenomenon and to determine, under certain conditions, the perceptions and attitudes of the human participants in a complex process--

appear applicable to other qualitative research topics, and not just knowledge utilization.

The single exception may have to do with a third research strategy for dealing with qualitative research, but that was not dominant in studying the topic of knowledge utilization: the analysis of documentary and archival records (e.g., Webb et al., 1966). These records, such as census tract data or other municipal and governmental data files, are often directly relevant to the investigation of a qualitative research topic. In some studies, the records may be the sole source of evidence, and this has become especially true with the development of the subfield "quantitative history," whose techniques are aimed solely at the analysis of archival records. However, these records are not a significant part of the knowledge utilization process, and the pertinent research designs for using such records were therefore ignored in our report. To this extent, our rendition of research designs for qualitative research is incomplete, and some topic in which these kinds of documentary and archival records have been prominent ought to be one of the priorities for extending the present work. To our knowledge, although some attention has been given to data collection techniques in using archival records (e.g., Cochran, Gordon, and Krause, 1980), no attempts have been made to determine whether unique research designs are also involved.

In spite of the void regarding this third research strategy, the findings in the present report may still provide the basis for further elaboration of qualitative research designs. Further corroboration concerning the importance of mixed (survey and case study) designs would be especially critical. The more robust finding, that such mixed designs were the most desirable for other qualitative research topics besides

knowledge utilization, would assist in developing a design-counterpart to the survey-case study complementarity that is already known about data collection.

Thus, for data collection, the existing evidence strongly suggests that survey and case study techniques can play complementary roles in defining terms, testing potential instruments, and assessing quantitative and qualitative factors (e.g., Sieber, 1973). For design, our tentative findings regarding the ability of surveys and case studies to address different types of research questions may be regarded as a countertheme to the more traditional interpretation, in which surveys and case studies are considered to be competing strategies for addressing the same research questions. Our claim would be that any qualitative research topic will involve questions of prevalence and questions of causal links, and that the survey is the better technology for addressing the former while the case study is the better technology for the latter. In this way, we view surveys and case studies as complementary, and not competing strategies, and this conclusion deserves further corroboration.

Ways of Intervening in the Design Process

Any lessons about research designs for qualitative research would not be helpful unless they suggested ways for intervening in the design process--and thus to improve future research designs. Are such interventions possible?

Clearly, the greatest burden must lie with the research investigator. If designs are to be improved in the future, research investigators must first be trained to understand the potential variations, and then know how to select the most feasible and effective design, given the nature of the research questions. To date, documentation about qualitative

research designs has been sparse, and investigators have not been exposed to the possibility that such options might exist in the first place. A major breakthrough, suggested by the present report, is simply that qualitative research may have its own set of formal designs, different in nature but similar in purpose to those used in experimental and quasi-experimental research. However, much further corroboration is needed before research investigators can have at their disposal a ready catalog of designs, similar to those available in experimental or quasi-experimental research (e.g., Campbell and Stanley, 1963).

For this reason, the potency of another source of intervention should also be explored. This source has to do with the role of R&D-funding agencies. Our report has already suggested that such agencies play an implicit role in designing research on knowledge utilization, as a result of the content of research solicitations and RFPs (see Chapter VI). If project management factors can affect research designs, and if R&D-funding agencies have control over project management factors, the agencies can clearly exert some influence over the design of qualitative research. Because few investigators would be willing to allow R&D-funding agencies to design their research directly, the use of project management factors as a point of leverage may even be more potent and attractive.

Chapter VI has already pointed out the various ways in which project management can affect research design. An important further step would be to corroborate these findings with some topic other than knowledge utilization, and then to develop some general guidelines for R&D-funding agencies. Such a point of intervention may be more effective, in the short run, in producing improved designs for qualitative research.

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Appendix A

PERSONS AND ORGANIZATIONS CONTACTED TO IDENTIFY KNOWLEDGE UTILIZATION STUDIES

1. Diana Crane
   Department of Sociology
   University of Pennsylvania
   Philadelphia, Pennsylvania
   (215) 243-6722

2. Robert Wuthnow
   Department of Sociology
   Princeton University
   Princeton, New Jersey
   (609) 452-4742

3. Tom Anyos
   SRI International
   Menlo Park, California
   (415) 859-2864

4. Renee Berger
   Research Associate
   Committee for Economic Development
   Washington, D.C.
   (202) 296-5860

5. Leonard Lund
   The Conference Board
   New York, New York
   (212) 759-0900

6. Michael Tushman
   School of Business Administration
   Columbia University
   New York, New York
   (212) 280-4271

7. Arnold D. Kaluzny
   School of Public Health
   University of North Carolina
   Chapel Hill, North Carolina
   (919) 966-2645

8. Dick Warnecke
   Illinois Comprehensive Cancer Center
   Chicago, Illinois
   (312) 996-6130

9. Judy Brown

   (415) 921-7526

10. Paul Hood
    Far West Laboratory
    San Francisco, California
    (415) 565-3000

11. Jane Siegel
    Carnegie Mellon University
    Pittsburgh, Pennsylvania
    (412) 578-2848

12. Judy Larsen
    American Institutes for Research
    Palo Alto, California
    (415) 493-3550

13. Steve Rosenthal
    Boston University
    Boston, Massachusetts
    (617) 353-2770

14. Charles Kadushin
    City University of New York
    New York, New York
    (212) 921-8208

15. Patricia Bourexis
    American Institutes for Research
    Palo Alto, California
    (415) 493-3550

16. Mary Jo Dukes and
William Dunn
University of Pittsburgh
Pittsburgh, Pennsylvania
(412) 624-3776

17. Jeffrey Schiller
National Institute of
Education
Washington, D.C.
(202) 254-6271

18. Edward Kelly
National Science Foundation
Washington, D.C.
(202) 357-7560

19. Mary Kennedy
The Huron Institute
Cambridge, Massachusetts
(617) 491-5450

20. Toni Antonucci
Institute for Social Research
University of Michigan
Ann Arbor, Michigan
(313) 764-6563

21. Allen Parker
Center on Technology and
Society, Inc.
Cambridge, Massachusetts
(617) 491-1112

22. William Firestone
Research for Better Schools
Philadelphia, Pennsylvania
(215) 574-9300

23. David P. Crandall
The NETWORK, Inc.
Andover, Massachusetts
(617) 470-1080

24. Karen Seashore Louis
Center for Survey Research
University of Massachusetts
Boston, Massachusetts
(617) 542-7037

25. Doren Madey
NTS Research Corporation
Durham, North Carolina
(800) 334-0077

26. Paul Houts
Carnegie Foundation for the
Advancement of Teaching
Washington, D.C.
(202) 797-3650

27. James Gollub
SRI International
Menlo Park, California
(415) 326-6200

28. National Academy of Public
Administration
Washington, D.C.
(202) 828-6500

29. Benjamin B. Gordon
Battelle Memorial Institute
Columbus, Ohio
(614) 424-6424

30. Everett Rogers
Institute for Communication
Research
Stanford University
Palo Alto, California
(415) 497-2753

31. Peggie Campeau
American Institutes for Research
Palo Alto, California
(415) 493-3550

32. Paul DiMaggio
Department of Sociology
Yale University
New Haven, Connecticut
(203) 432-3864

33. Noel Tichy
School of Business
University of Michigan
(313) 764-1289

34. Daryl Chubin
Department of Social Science
Georgia Institute of Technology
Atlanta, Georgia
(404) 894-3195

35. Daniel Berry
Director, Urban Affairs
Kettering Foundation
Dayton, Ohio
(513) 434-7300

36. Jane Belan
Vice-President, Social Systems
Control Data Corporation
Minneapolis, Minnesota
(612) 853-8100

37. Paul Poppen
Department of Psychology
George Washington University
Washington, D.C.
(202) 676-6324

38. Robert Herriott
Research Sociologist
Concord, Massachusetts
(617) 369-9779

39. Senta Raizen
National Academy of Sciences
Washington, D.C.
(202) 241-1973

40. Irwin Feller
Director, Institute for Policy Research and Evaluation
Pennsylvania State University
University Park, Pennsylvania
(814) 865-9561

41. Tom Becker and Edward Glaser
Human Interaction Research Institute
Los Angeles, California
(213) 879-1373

42. Robert Rich
Woodrow Wilson School
Princeton University
Princeton, New Jersey
(609) 452-4822

43. Judy Alamprese
National Institute of Education
Washington, D.C.
(202) 653-5839

44. J. D. Eveland
National Science Foundation
Washington, D.C.
(202) 357-9804

45. Phyllis Ellickson
The Rand Corporation
Santa Monica, California
(213) 393-0411

46. Steven Waldhorn
SRI International
Menlo Park, California
(415) 326-6200

47. Florence Holmes
Designs for Change
Chicago, Illinois
(312) 922-0317

48. Matthew Miles
Center for Policy Research, Inc.
New York, New York
(212) 870-2180

Appendix B

STUDIES NOT MEETING DEFINITIONAL CRITERIA
(though initially appearing to be knowledge utilization studies)

1. Innovation, Organizational Change or Implementation Studies

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